FACT SHEET FOR NPDES PERMIT NO. WA-005115-2

SDS LUMBER

SUMMARY

The SDS Lumber Company facility in Bingen, Washington is an integrated lumber mill that receives logs for processing into lumber, plywood and wood chips. Hog fuel (wood waste) is burned to generate steam, which in turn runs one electric generating turbine to supply power to the facility and for sale to the Klickitat PUD. A second turbine is scheduled to go on line in June 2005 increasing the electric generating capacity of SDS Lumber to more than10 megawatts.

The property is located on a partially manmade spit on the north shore of the Columbia River at an elevation of between 100 and 120 feet above mean sea level. The facility occupies approximately 180 acres of land. The SDS Lumber Company facility currently operates seven days per week, 50 weeks per year.

The Permit authorizes discharges from two outfalls. The discharge from Outfall #001 consists of non-contact cooling water (NCCW). Once both steam turbines are in operation, a maximum of 25 MGD of NCCW will be discharged through Outfall 001. The discharge from Outfall #002 contains water used to wet untreated logs held in storage to prevent insect and rapid drying damage. Excess water either infiltrates to ground immediately or the runoff is diverted to an infiltration pond/ bioswale.

Outfall #002 can be considered a discharge to ground; the spit on which the log deck is located is a manmade structure in direct hydraulic continuity with the Columbia River. Because of this, the Department is primarily concerned with the impact the discharge may have upon the Columbia River. The Permittee will be required to submit for Department approval and implement the approved plan for monitoring the dissolved oxygen (DO) concentration and pH in the area of the river most likely to be impacted by log deck seepage. No further monitoring will be required if the DO remains at 85% of saturation. If 85% of saturation is not achieved for three consecutive monitoring periods or the pH falls outside the permitted range the Permittee is required to contact the Department, at which time the monitoring plan may be modified. Prior to permit reissuance the data will be reviewed to determine if any permit conditions other than monitoring at outfall #002 are required.

The Permittee is required to submit for approval an updated Solid Waste Plan and an Outfall #001 Renovation Plan during the proposed permit cycle. In addition, the Permittee is required to complete renovation of the outfall during the proposed permit cycle.

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the State is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	SDS Lumber Company
Facility Name and Address	SDS Lumber State Highway 14 Bingen, WA 98605
Type of Facility:	Wood Products
SIC Code(s)	2412-Sawmill & Planning Mill 2436- Softwood Veneer & Plywood 2499-Non-classified Wood Products 4911-Electric Generation
Discharge Location	Waterbody name: Columbia River**,** River Mile 170 <u>Outfall #001</u> Latitude: 45° 42' 38" N Longitude: 121° 28' 22" W. <u>Outfall #002 S.E. Corner</u> Latitude: 45° 42' 38" N Longitude: 121° 28' 16" W.
Waterbody ID Number	WA-CR-1020

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

The SDS Lumber Company's facility, located in Bingen, Washington, is an integrated lumber mill that receives logs for processing into lumber, plywood and wood chips. Hog fuel (wood waste) is burned to generate steam. The steam runs one electricity generating turbine with a second turbine slated to come on line in June 2005. The turbines will generate in excess of 10 megawatts of power. The turbines supply power to the facility and the excess is sold to the Klickitat PUD. The property is located on a partially manmade spit along the Columbia River at an elevation of between 100 and 120 feet above mean sea level. The facility occupies approximately 180 acres of land. The SDS Lumber Company facility currently operates seven days per week, 50 weeks per year.

History

SDS is one of the largest employers in Klickitat County, employing 350 people during its busiest production times. SDS Lumber Company began operation in 1946 when it acquired the property from an existing lumber mill. The original mill was rebuilt following a fire in 1948.
The current NPDES permit was issued in 1994 to Klickitat Energy Partners and SDS Lumber. On April 28, 2004 the Department received a letter from SDS lumber stating that the partnership

between SDS Lumber and the Klickitat Energy Partners had been dissolved. Therefore, SDS Lumber is now the sole entity responsible for complying with the NPDES permit.

Industrial Processes

Operations at the site include production of finished lumber and plywood; storage and handling of logs, finished lumber and wood chips; generation of steam and electric power derived from hog fuel (wood waste); and vehicle and equipment maintenance.

The electric power generated at the facility supplies the electric needs of the entire facility. The excess power generated is sold to the Klickitat PUD, as demand allows.

Discharge Outfall #001 and #002

Outfall #001

The discharge from Outfall #001 consists of pass through, non-contact cooling water (NCCW). Columbia River water enters the system via a 42 inch pipe that originates at the pump house located on the eastern shore of the lagoon. The lagoon is defined by a spit which runs parallel with the river for approximately one-half mile. Two pumps capable of pumping approximately 8000 gpm deliver the much cooler river water to the steam plant where it cools the steam causing it to condense. The NCCW is then expelled through a 36” pipe that exits the steam plant parallel to the intake. The 36” pipe extends 290 feet from shore into the river at a forty-five degree angle to the river flow. The last 80 feet of the outlet pipe consists of a 9 port, opened-end diffuser.

The most recent inspection of the diffuser, conducted on August 26, 2002, revealed that it is cracked at the point where the diffuser and the outlet pipe meet. For this reason, Cormix 3.4 GI, a mixing zone modeling program, was run using a number of scenarios to best model for the current state of the diffuser array.

Outfall #002

During the warmer and dryer months of the year, harvested logs stored in the log yard are sprayed with water from the same source as Outfall #001 to minimize insect damage and to prevent checking. Insect damage and checking (a result of rapid drying) will seriously devalue a log damaged in this manner.

Water applied to the logs and any subsequent infiltration to ground is considered outfall #002. The spit on which the log yard is located is manmade. The spit is constructed of dredge and fill material over rubble, river gravel and riprap. Runoff infiltrating to ground in the log yard is essentially a groundwater discharge, but due to the substrate of the log yard and the close proximity of the Columbia River, the greater concern is the preservation of the water quality of

the river. Runoff from the logs entering the groundwater below the log deck or bioswale rapidly reaches the Columbia River.

SDS Lumber recently constructed an infiltration pond/bioswale between the river and the log deck. The bioswale is approximately one acre in size. The bioswale contains native wetland plants and some invasive species.

PERMIT STATUS

The previous permit for this facility was issued on **November 28, 1994** and an application for permit renewal was received on July 15, 1999. The Department administratively extended the existing permit on **January 1, 2000** to coincide with the Department's watershed approach to permit renewals.

The Permittee resubmitted an application for renewal on August 12, 2002 which was accepted on August 22, 2002**.**

The current permit places limitations on the non-contact cooling water for Flow, Temperature, pH, Residual Chlorine, TSS, and Oil and Grease.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received an inspection on February 7, 2005. The facility was in excellent condition and appeared well run.

During the history of the previous permit, the Permittee has remained in substantial compliance based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The Permittee incurred one violation in February 2003 for flow at 12 MGD with a limit of 10.5 MGD.

The Permittee under the conditions of the current permit was required to conduct a Chlorine Minimization Study and an Intake Filter Backwash Study on the discharge from Outfall #001. In a letter to the Department dated March 18, 2002 SDS Lumber stated it is no longer using chlorine in the steam plant operations. In the same letter SDS Lumber asked for an 18 month extension, which was granted, to study practical means to evaluate alternative methods to be used in the backwash study. In a follow up letter dated February 16, 2005 SDS Lumber stated the filter backwash is no longer discharged, but is now diverted to a concrete vault for evaporation.

WASTEWATER CHARACTERIZATION

The Permittee's non-contact cooling water discharge is characterized for the following parameters as reported in the application for permit renewal from three one time grab samples:

Wastewater Characterization

Parameter	Concentration
pH	6 to 9 std. units
Ammonia	Non-Detect
TSS	55 mg/L
BOD	4.0 mg/L
COD	20.0 mg/L
TOC	3.3 mg/L
Copper	9 µ/L
Lead	2 µ/L

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Part 40, Code of Federal Regulations entitled Protection of Environment contains technological-based wastewater discharge limits for certain categories of industries. Section 423 sets standards for Steam Electric Generating Point Source Category.

Electrical generation at SDS lumber derives its energy from biomass, which exempts the facility from 40 CFR Technology Based Limitations. The energy generated at SDS Lumber is primarily used at the facility. Surplus electricity generated at the facility is sold to Klickitat Public Utility District as demand dictates.

Performance Based Limitations applied to the Outfall #001 discharge were derived for temperature using the temperature data supplied by the Permittee on their DMR report for the past two years. The Department spreadsheet used to derive the limitations uses the lognormal transformed mean and variance (See Appendix C). The limitations derived are contained in the table below:

Allowable Temperature Rise Above Ambient River Temperature	
Maximum Daily	8.3º C
Average Monthly	6.7º C

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a State regulation designed to protect the beneficial uses of the surface waters of the State. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the waterbody. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

Critical Conditions

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic waterbody uses.

Mixing Zones

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

Description of the Receiving Water

The facility discharges to the Columbia River, which is designated as a Class A receiving water. The river is 303d listed for temperature in the vicinity of the outfall. Other nearby point source outfalls include Cities of Bingen and White Salmon in Washington, plus Hood River and The Dalles in Oregon. Significant nearby non-point sources of pollutants include agricultural runoff from farming, vineyards and logging in the higher elevations. Characteristic uses include the following:

> *water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.*

Surface Water Quality Criteria

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Applicable Water Quality Criteria

Parameter	**Criteria**
Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	90% of Saturation
Temperature	20 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	Less than 5 NTU above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

173-201A-130 (20) WAC lists special conditions for the Columbia River from the mouth to the to river mile 309. The temperature shall not exceed 20º C. Where the temperature exceeds 20º C the permissible increase is 0.3º C from any single source or 1.1º C due to all such activities. Dissolved oxygen shall not be lower than 90% of the oxygen saturation at ambient river temperature.

The reach of the Columbia River in which SDS Lumber is located is 303d (1998) listed for temperature and dissolved gas. As of this time, waste load allocations for temperature have not been promulgated by the U.S. EPA. The EPA anticipates that few existing point-source

dischargers will have temperature limitations. In the event TMDL wasteload allocations impact the permitted discharge of SDS Lumber the conditions of the permit may be changed through either a permit modification of reissuance of the permit.

Consideration of Surface Water Quality-Based Limits for Numeric Criteria

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The chronic mixing zone length shall extend in a downstream direction for a distance of 323 feet and 100 feet upstream. The discharge centerline dilution boundary as modeled by CORMIX 4.3GI allows for a plume half width of 140 feet for each port. The diffuser length with the nine ports is eighty feet allowing for an individual plume width of 140 feet for each port the entire width of the outfall #001 plume is eighty feet plus 140 feet on each side or 360 feet.

The acute mixing zone is defined at 32 feet downstream and 10 feet upstream with plume half width of 41 feet for each port which equals 162 feet for the full diffuser array.

The dilution factors of effluent to receiving water that occur within these zones were determined at the critical condition by the use of CORMIX 4.3GI and Visual Plumes 1.01. Different modeling scenarios were conducted to assess the impact of flow through the 9 ports or an open ended pipe. Different proportions of flow through the ports and the open end of the diffuser were also considered. This was done to account for the present condition of the outfall. Of the two models CORMIX 4.3 GI proved to be the most restrictive, where the model allowed for 10 ports with the extra port accounting for the gap in the diffuser connection, including the open ended pipe. Visual Plumes calculates a dilution factor of 109 for a 9 port diffuser where CORMIX 4.3 calculates one at half that value. The more restrictive CORMIX 4.3 GI dilution factors have been determined to be (from Appendix C). The proposed permit with allow the dilution factors contained in the table below:

Mixing Zone Type	Chronic
Aquatic Life	50.2

The worst case CORMIX 4.3 GI scenario, where 25 MGD is flowing through the open end pipe yields a chronic dilution factor of 37.7. Therefore, the permit writer believes that by allowing for an additional port to substitute for the crack in the 9 port array, and in light of visual confirmation of flow through all the ports, the dilution factors selected are reasonable.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the

receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Columbia River in the vicinity of the outfall is the low river flow determined by the network of dams upriver of the outfall. Ambient data at critical conditions in the vicinity of the SDS Lumber outfall were taken from the ongoing Departmental Environmental Assessment Program monitoring study, U.S.G.S. ambient monitoring data, and the diffusion analysis submitted by Dames and Moore 1994.

Data Used in Reasonable Potential Determination

Parameter	Value used
Managed low flow	80,000 cfs
Velocity	0.7116 ft/sec
Depth	28 feet
Width	2,810 feet
Roughness (Manning)	n=0.045
Temperature	20 ^{o} C
pH (high 10yr avg.)	8.47
Dissolved Oxygen	8.0 mg/L
Hardness	63.3 mg/L as CaCO3
Lead	0.26 µg/L
Copper	1.13 ug/L

Filter backwash which previously was discharged with the non-contact cooling water is now diverted to a concrete vault and not discharged but used to pre-soak logs prior to peeling for plywood veneer. Because of this, the once through non-contact cooling water constituting this discharge at outfall #001 is not expected to contain any BOD other than that contained in the intake water and, therefore, BOD is not considered a parameter of concern. The impacts of temperature, copper and lead were determined as shown below, using the dilution factors at critical conditions described above.

Temperature and pH--The impact of the temperature of the receiving water was modeled by simple mixing analysis at the critical condition and with CORMIX 4.3GI. The receiving water temperature at the critical condition is 20 ^{o}C and the maximum daily effluent temperature is 28.3 ^{o}C. The predicted resultant temperature for both the mass balance equation and CORMIX 4.3GI at the boundary of the chronic mixing zone is 20.165 ^{o}C. The incremental rise is 0.165 ^{o}C, which is well below the allowable 0.3 ^{o}C incremental rise contained in 173-201A-130 WAC for this

reach of the Columbia River. The worst case model, where 25 MGD flows through the open ended pipe, yields a predicted temperature of 20.17 ºC with a rise of 0.17 ºC over ambient. Either scenario yields a temperature rise well below the allowed 0.3 incremental rise.

The past two years temperature monitoring of the unmixed discharge at outfall #001 yields an average temperature rise above the intake of 1.9 ºC with a maximum of 3.4 º C. In addition, the intake river water passes through with no chemical treatments that would affect the pH. Under critical conditions there are no predicted violations for temperature and pH of the Water Quality Standards for Surface Waters.

Following five years of monitoring the temperature rise of the intake water at the outfall #001 with both electrical turbines at full capacity, the data will be reviewed to determine if Performance Based Limits are more appropriate than the Water Quality Based Limits.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: copper and lead. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

Valid ambient background data was available for copper and lead. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards.

Whole Effluent Toxicity

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge, as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

Human Health

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the State by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health.

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

The discharge at Outfall #002 of climate control water applied at the log deck is via infiltration, but it is in the Best Professional Judgment of the permit writer it does not constitute a discharge to ground due to the strong hydraulic connection this subsurface water has with the Columbia River.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED NOVEMBER 28, 1994

Existing Limits	Maximum Daily	Proposed Limits	Maximum Daily
Flow	25 MGD (10.5)[1]	Flow	25 MGD
Temperature Differential	8.4º C	Temperature	8.3º C max day – 6.7º C avg. mo
pH	6.0 – 9.0	pH	6.0 – 9.0
Total Residual Chlorine	0.2 mg/L	Not applicable [2]	

[1] In accordance with Administrative Order No DE 94WQ-C443 issued December 12, 1994, the Permittee is allowed an interim flow limit 10.5 MGD.
[2] Chlorine use has been discontinued.

In accordance with Administrative Order No DE 94WQ-C443 issued December 12, 1994, the Permittee is allowed an interim flow limit 10.5 MGD. One month prior to operation of the second turbine SDS Lumber Company is required to submit a letter of notification that the second turbine will begin operation on a specified date and request that the interim limits be rescinded.

The Permittee submitted a letter received at the Department on April 18, 2005 stating that the second turbine will be installed on or before June 30, 2005. The letter contains a formal request for authorization to discharge 25 million gallons per day (MGD) in the proposed permit cycle. The second of the two 5 mega watt (MW) turbines will be in operation on or before the proposed permit becomes effective. Therefore, Administrative Order DE 94WQ-C443 will be rescinded and the proposed permit authorizes the 25 MGD discharge.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The Permittee is required to monitor the pH continuously (S2.A.).

The non-contact cooling water flow will be required to be monitored via a calibrated pump power curve. A pump power curve will be required to be conducted and submitted to the Department annually to assure flow measurement accuracy (S2.D.).

Temperature of the intake water will be required to be monitored hourly before and after passing through the steam turbine cooling system (S2.A.). The highest differential in temperature observed for the day will be recorded on the DMR.

The Permittee is also required to develop a Sampling and Monitoring Plan (SAP) in Special Condition 4 of the permit to assess the impact of the discharge on the quality of the Columbia River in the vicinity of Outfall #002.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.*

The Permittee will be taking field measurements for pH and DO and therefore will not be required to obtain lab accreditation; however the test equipment and methodology will be subject to Departmental approval.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The provisions of Special Condition S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to State waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to review this plan annually and submit updates as necessary to the Department.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the State from leachate of solid waste.

This proposed permit requires that the Permittee update its Solid Waste Plan to prevent solid waste from causing pollution of waters of the State. The plan must be submitted to the Department, and to the local permitting agency for approval, if required by local ordinance.

SAMPLING AND ANALYSIS PLAN

As discussed previously, the primary concern of the Department is the potential for negative impact upon the quality of the hydrologically connected Columbia River. Therefore, in Special Condition S.4. of the proposed permit, the Permittee is required to develop a Sampling and Analysis Plan and submit it for Department approval.

It is in the Best Professional Judgment of the Permit writer that oxygen depleted water with low pH would comprise the largest part of any potential contamination to the Columbia River. The State water quality criteria for this reach of the Columbia River established a special condition

for dissolved oxygen at 90% of saturation. Therefore, prior to requiring more sophisticated and costly monitoring procedures and equipment aimed at mitigation or containment in the area of Outfall #002, oxygen saturation has to fall below 85% at the interface between the Columbia River and Outfall #002. In addition to the DO saturation level, the Permittee will also be required to notify the Department if the pH has fallen outside the range of 6 to 9 for three consecutive months at the same location.

- The Permittee is required to estimate the amount of water applied to the log yard on a monthly basis. This can be done by calibrating the number of gallons of water applied per hour of pump operation and multiplying that by the number hours the pump is in operation.
- Monitor the quality of the water contained in the infiltration pond.
- The Permittee is required to implement the approved dissolved oxygen (DO) monitoring plan, complete with sampling locations, to determine if oxygen depleted water from beneath the log yard is impacting the Columbia River.
- The Permittee will maintain calibration and maintenance manuals and records for the proper operation and maintenance of the test equipment.
- If after three consecutive monitoring periods the DO concentration is below 85% of saturation, the Permittee is required to consult with the Departmental hydrogeologist to determine if the monitoring plan needs modification.

OUTFALL RENOVATION

An outfall evaluation was conducted on August 26, 2003 by two Parametrix Inc., divers. They reported that the diffuser section of the outfall had settled at a steeper angle then originally installed, possibly due to scour. They observed that the diffuser section has separated from the main pipe by approximately 4 inches. It appeared that the retaining clips holding the diffuser to the main pipe had become unattached. They confirmed that the dyed effluent was flowing through the 9 eight inch diffuser holes as well as out the end of the diffuser. They incorrectly reported that the end pipe was missing although the design did not call for one.

Parametrix Inc. recommended the diffuser be reattached to the main pipe and suggested some rock be placed over the lower portion of the pipeline and along the diffuser section to minimize scour.

Special Condition S7 requires the Permittee to submit for approval a plan to renovate the diffuser assembly and complete renovation during the proposed permit cycle.

GENERAL CONDITIONS

General Conditions are based directly on State and Federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended State or Federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)
Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A -- PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 25, 2002 in the White Salmon Enterprise and the Goldendale Sentinel to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on June 9, 2005 in the White Salmon Enterprise to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30 day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509/457-7105, or by writing to the address listed above.

This permit and fact sheet were written by Richard A. Marcley.

APPENDIX B -- GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving waterbody.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a waterbody is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a waterbody can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Responsible Corporate Officer-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface waterbody, or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C -- TECHNICAL CALCULATIONS

10 Port 25 MGD

```
                    CORMIX MIXING ZONE EXPERT SYSTEM
                        CORMIX-GI Version 4.3GT
                     HYDRO2:Version-4.3  April,2004
SITE NAME/LABEL:
  DESIGN CASE:                  SDS Lumber
  FILE NAME:                    Y:\WPFILES\MARCLEY\CINDY DRAFTS\SDS to
Lumber9port25mgd.prd
Using subsystem CORMIX2:        Submerged Multiport Diffuser Discharges
  Start of session:             06/02/2005--11:48:04
*******************************************************************
SUMMARY OF INPUT DATA:
-------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                         = bounded
  Width                          BS     = 856.79 m
  Channel regularity             ICHREG = 1
  Ambient flowrate               QA     = 2265.35 m^3/s
  Average depth                  HA     = 12.19 m
  Depth at discharge             HD     = 8.53 m
  Ambient velocity               UA     = 0.2169 m/s
  Darcy-Weisbach friction factor F      = 0.0691
    Calculated from Manning's n         = 0.045
  Wind velocity                  UW     = 3 m/s
Stratification Type              STRCND = U
  Surface temperature                   = 20
 degC
  Bottom temperature                    = 20 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density                RHOAS  = 998.2051 kg/m^3
  Bottom density                 RHOAB  = 998.2051 kg/m^3
-------------------------------------------------------------------
```

```
------------------------------------------------------------------------------
DISCHARGE PARAMETERS:              Submerged Multiport Diffuser Discharge
  Diffuser type                    DITYPE = alternating perpendicular
  Diffuser length                  LD     = 24.38 m
  Nearest bank                            = right
  Diffuser endpoints               YB1    = 60.96 m;    YB2 = 85.34 m
  Number of openings               NOPEN  = 10
  Spacing between risers/openings  SPAC   = 2.71 m
  Port/Nozzle diameter             DO     = 0.2286 m
    with contraction ratio                = 0.8
  Equivalent slot width            BO     = 0.0135 m
  Total area of openings           TAO     = 0.3283 m^2
  Discharge velocity               UO     = 3.34 m/s
  Total discharge flowrate         QO     = 1.095316 m^3/s
  Discharge port height            HO     = 0.91 m
  Nozzle arrangement               BETYPE = near vertical discharge
  Diffuser alignment angle         GAMMA  = 90 deg
  Vertical discharge angle         THETA  = 90 deg
  Horizontal discharge angle       SIGMA  = 0 deg
  Relative orientation angle       BETA   = 90 deg
  Discharge temperature (freshwater)      = 28.30 degC
    Corresponding density          RHOO   = 996.1481 kg/m^3
  Density difference               DRHO   = 2.0570 kg/m^3
  Buoyant acceleration             GPO    = 0.0202 m/s^2
  Discharge concentration          CO     = 8.300000 deg.C
  Surface heat exchange coeff.     KS     = 0 m/s
  Coefficient of decay             KD     = 0 /s
------------------------------------------------------------------------------
********************** REGULATORY MIXING ZONE SUMMARY **********************
The plume conditions at the boundary of the specified RMZ are as follows:
  Pollutant concentration                 = 0.165406  deg.C
Corresponding dilution                    = 50.2
  Plume location:                    x = 99.06 m
    (centerline coordinates)         y = 0 m
                                     z = 8.53 m
  Plume dimensions:            half-width = 22.45 m
                                thickness = 5.64 m
```

One Port 25 MGD

```
                    CORMIX MIXING ZONE EXPERT SYSTEM
                        CORMIX-GI Version 4.3GT
                     HYDRO1:Version-4.3  April,2004
SITE NAME/LABEL:
  DESIGN CASE:                  SDS Lumber
  FILE NAME:                    Y:\WPFILES\MARCLEY\CINDY DRAFTS\SDS\Vis
Using subsystem CORMIX1:        Submerged Single Port Discharges
  Start of session:             04/05/2005--16:05:42
*******************************************************************
SUMMARY OF INPUT DATA:
-------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                          = bounded
  Width                          BS      = 856.79 m
  Channel regularity             ICHREG  = 1
  Ambient flowrate               QA      = 2265.35 m^3/s
  Average depth                  HA      = 12.19 m
  Depth at discharge             HD      = 8.53 m
  Ambient velocity               UA      = 0.2169 m/s
  Darcy-Weisbach friction factor F       = 0.0691
    Calculated from Manning's n          = 0.045
  Wind velocity                  UW      = 3 m/s
Stratification Type              STRCND  = U
  Surface temperature                    = 20
 degC
  Bottom temperature                     = 20 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density                RHOAS   = 998.2051 kg/m^3
  Bottom density                 RHOAB   = 998.2051 kg/m^3
```

```
-------------------------------------------------------------------------
DISCHARGE PARAMETERS:                Submerged Single Port Discharge
  Nearest bank                                = left
  Distance to bank                   DISTB    = 85.34 m
  Port diameter                      DO       = 0.9144 m
  Port cross-sectional area          AO       = 0.6567 m^2
  Discharge velocity                 UO       = 1.67 m/s
  Discharge flowrate                 QO       = 1.095316 m^3/s
  Discharge port height              HO       = 0.46 m
  Vertical discharge angle           THETA    = 0 deg
  Horizontal discharge angle         SIGMA    = 90 deg
  Discharge temperature (freshwater)          = 26.5 degC
    Corresponding density            RHOO     = 996.6501 kg/m^3
  Density difference                 DRHO     = 1.5550 kg/m^3
  Buoyant acceleration               GPO      = 0.0153 m/s^2
  Discharge concentration            CO       = 6.5 deg.C
  Surface heat exchange coeff.       KS       = 0 m/s
  Coefficient of decay               KD       = 0 /s
  ********************** REGULATORY MIXING ZONE SUMMARY ********************
  The plume conditions at the boundary of the specified RMZ are as follows:
    Pollutant concentration                = 0.172356  deg.C
  Corresponding dilution                   = 37.7
    Plume location:                      x = 99.06 m
      (centerline coordinates)           y = 24.78 m
                                         z = 8.53 m
    Plume dimensions:              half-width = 17.77 m
                                    thickness = 5.36 m
```

Temperature Mass Balance Model Based on Cormix 3.4 Chronic Dilution Factor of 50.2

eff flow	effluent temp	dil valuator	ambient temp	**final temp**	**dil factor**
1.39	28.3	68.4	20	20.165	50.2

Temperature Increase Limit 0.3 C

Predicted Increase 0.165 °C

Modeled assuming all flow through 9 7.5 inch ports

Visual Plumes, Ver. 1.01; U.S. Environmental Protection Agency, ERD-Athens, ORD, 8 April 2002

Diffuser, Flow, Mixing Zone Inputs

Port diameter	n/r	Port elevation	Vertical angle	Hor angle	Num of ports	Port spacing	n/r	n/r	n/r	Acute mix zone	Chronic mix zone	Port depth	Effluent flow	Effluent salinity(*)	Effluent temp	Effluent conc
in	m	ft	deg	deg		ft	s	s	s	ft	ft	ft	MGD	psu	C	%
7.5		3	-11	90	9	6.6				32.5	325	24	25	0	28.3	100

```
Ambient Table:
     Depth    Amb-cur    Amb-dir    Amb-sal    Amb-tem    Amb-pol      Decay    Far-spd    Far-dir    Disprsn    Density
         m        m/s        deg        psu          C      kg/kg       s-1        m/s        deg  m0.67/s2    sigma-T
       0.0      0.213       90.0        0.0       20.0        1.0        0.0      0.213       90.0     0.0003     -1.733
     12.19      0.213       90.0        0.0       20.0        1.0        0.0      0.213       90.0     0.0003     -1.733

Diffuser table:
   P-dia  P-elev V-angle H-angle   Ports Spacing AcuteMZ ChrncMZ P-depth Ttl-flo Eff-sal    Temp Polutnt
    (in)    (ft)   (deg)   (deg)     ()     (ft)    (ft)    (ft)    (ft)   (MGD)   (psu)     (C)     (%)
     7.5     3.0  -11.0    90.0     9.0      6.6    32.5   325.0    24.0    25.0     0.0    28.3   100.0

Simulation:
Froude number:      68.74; effluent density (sigma-T)  -3.7900325; effluent velocity      4.27(m/s);
          Depth  Amb-cur    P-dia     Temp  Polutnt    Dilutn  CL-diln   x-posn   y-posn
Step       (ft)   (ft/s)     (in)      (C)     (%)        ()       ()     (ft)     (ft)
   0       24.0     0.7      7.5     28.3   100.0       1.0      1.0      0.0      0.0;
Potential for more dilution
  93      25.31     0.7    41.78    21.32   100.0     6.296    6.296      0.0    7.757; bottom hit;
 132      26.57     0.7    79.86    20.61   100.0     13.63    13.63      0.0    18.03; merging;
 153      27.74     0.7    126.3     20.4   100.0     20.65    20.65      0.0    32.87; acute zone;
 175      28.73     0.7    222.8    20.26   100.0     31.93    31.93      0.0    71.53; local maximum rise or fall.
 207       20.5     0.7    497.2    20.14   100.0     60.17    60.17      0.0    188.0; surface;
 214      16.75     0.7    587.7    20.12   100.0     69.11    69.11      0.0    216.9; matched energy radial vel
 237     -1.026     0.7    999.1    20.08   100.0     109.0    109.0      0.0    328.4; chronic zone;
 284     -79.74     0.7   2766.3    20.03   100.0     276.4    276.4      0.0    722.5; matched energy radial vel
```

REASONABLE POTENTIAL CALCULATIONS

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98

State Water Quality Standard

Max concentration at edge of...

Parameter	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Conc (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?	Effluent percentile value	Pn	Max effluent conc. measured (metals as total recoverable)	Coeff Variation	s	# of samp	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	Acute	Chronic	ug/L	ug/L	ug/L	ug/L	ug/L			Pn	ug/L	CV	s	n			
COPPER - 744058 6M Hardness dependent	0.996	0.996	1.1300	4.61	3.47	2.43	2.23	NO	0.95	0.050	9.00	0.60	0.55	1	6.20	42	49.6
LEAD - 7439921 7M Dependent on hardness	0.466	0.466	0.2600	13.88	0.54	0.39	0.37	NO	0.95	0.050	2.00	0.60	0.55	1	6.20	42	49.6

Solubility of oxygen in water at various temperatures and pressures
[In milligrams per liter. Values based on Weiss (1970). C, degrees Celsius; mmHg, millimeters of mercury]

Temp., C	Atmospheric pressure, mmHg: 790	780	770	760	750	740	730
	Inches of Hg: 31.1	30.7	30.3	29.9	29.5	29.1	28.7
16	10.2	10.1	10.0	9.8	9.7	9.6	9.5
17	10.0	9.9	9.8	9.6	9.5	9.4	9.3
18	9.8	9.7	9.6	9.4	9.3	9.2	9.1
19	9.6	9.5	9.4	9.3	9.1	9.0	8.9
20	9.4	9.3	9.2	9.1	8.9	8.8	8.7
21	9.2	9.1	9.0	8.9	8.8	8.6	8.5
22	9.1	9.0	8.8	8.7	8.6	8.5	8.4
23	8.9	8.8	8.7	8.6	8.4	8.3	8.2
24	8.7	8.6	8.5	8.4	8.3	8.2	8.0
25	8.6	8.5	8.3	8.2	8.1	8.0	7.9
26	8.4	8.3	8.2	8.1	8.0	7.9	7.8
27	8.3	8.2	8.0	7.9	7.8	7.7	7.6
28	8.1	8.0	7.9	7.8	7.7	7.6	7.5
29	8.0	7.9	7.8	7.7	7.6	7.5	7.3
30	7.8	7.7	7.6	7.5	7.4	7.3	7.2

APPENDIX D -- RESPONSE TO COMMENTS

Columbia Riverkeeper and the Northwest Environmental Defense Center Comment:

1. This permit renewal lacks a meaningful analysis of whether SDS Lumber's once-through cooling system is AKART. Several state of the art technologies exist, including closed-loop cooling systems, which can drastically reduce the amount of water this facility uses in its cooling process. Numerous industrial facilities across Washington, with the support of the Department of Ecology, have upgraded their once-through cooling systems to these technologies in order to conserve more water and meet their effluent limits for temperature. For example, after modernizing its cooling system to a closed-loop system, KB Alloys (NPDES Permit No WA-000297-6) in Malaga, Washington reduced its discharge of hot water into the Columbia by 40,000 gallons per day. No explanation was provided as to why these advanced technologies were not considered AKART for the SDS Lumber facility. In fact, none of these advanced technologies were even mentioned in the SDS Lumber Fact Sheet. In light of the considerably large quantity of hot water discharged by SDS Lumber, the demonstrated benefits of upgrading to closed-loop systems, and the fact that the Columbia River is 303(d) listed for temperature, a thorough investigation as to whether this facility's once-through cooling system meets AKART standards needs to be performed and the results made available to public scrutiny.

Question: What is the scientific and technical basis for asserting that this once-through cooling system used by SDS Lumber is "state of the art" or the "best available treatment technology?"

Departmental Response:

The Central Regional Office oversees many facilities that operate various wastewater cooling systems. The most common of which is a heat exchanger cooling system that uses the latent heat of evaporation to cool the discharge. The system is sized according to the volume of the discharge. The efficiency of the system is related to ambient air temperature, relative humidity and the heat differential between the wastewater and ambient air conditions. Normally the hotter the wastewater the more efficient the system will operate and greater the evaporative losses.

KB Alloys, which you refer to in your comments, has a maximum discharge limit of 0.30 MGD of which 6% is lost to evaporation. This translates into a potential loss of 0.018 MGD. At that same rate, SDS Lumber would lose 1.5 MGD. SDS Lumber on the other hand operates without loss to 25 MGD due to one pass cooling of the turbines. The incremental rise above ambient temperature is small. The SDS permitted temperature differential is below 15º F, while KB Alloys is permitted to discharge 3 times that differential. KB Alloys works with molten metals. Extremely hot water is generated in this process and a heat exchanger system works best under those conditions. SDS Lumber on the other hand generates an extremely small temperature differential, which would require multiple large sized heat exchangers just based on the physics of the system. During the summer months this reduction might only be a few degrees Fahrenheit

at best. It is conceivable that at certain times no heat loss would be incurred with such a system in place.

SDS Lumber is space limited so the sizing of any cooling systems including ponds needs be small. In addition, the energy needed to run any cooling system has to be factored in and the target cooling range has to be established in order to develop design criteria. At this time, there have been no temperature allocations promulgated by the U.S. EPA for the Columbia River and it would be premature for the Department to require SDS Lumber to incur the considerable expense of engineering and installing a cooling system without a specific goal, while the discharge is clearly within the allowed rise in temperature at the edge of the chronic mixing zone according to Chapter 173-201A WAC.

Columbia Riverkeeper and the Northwest Environmental Defense Center Comment:

2. SDS Lumber is not exempt from 40 CFR Technology Based Limitations. The fact sheet is incorrect when it states that SDS Lumber is exempt from 40 CFR Technology Based Limitations for two reasons. First, SDS Lumber does not fall under the Steam Electric Point Source Category. According to that category, a facility is a steam electric point source when energy production is their primary engagement. Energy production is not the primary engagement of SDS Lumber. SDS Lumber is a lumber mill which generates steam to produce electricity for its facility like most other lumber mills do. The fact that they sell excess electricity to a local PUD does not make them a steam electric point source. Therefore, since SDS Lumber is not an electric point source, the technology based limitations exemption for electric point sources that generate electricity from biomass does not apply. Second, assuming that SDS Lumber is a steam electric point source, the facility still falls under several other categories for which they are not exempt from technology based limitations. As listed in the SDS permit, these categories include: General Sawmill and Planning, Softwood Veneer and Plywood, and Non-Classified Wood Products. These categories have their own technology based limitations. Therefore, even if SDS Lumber is exempt from 40 CFR Technology Based Limitations for steam electric point sources that does not exempt them from technology based limitations for the other three categories.

Question: What authority exempts a facility from Technology Based Limitations for meeting the exemption conditions of one category but not for the several other categories that it falls under?

Departmental Response:

None, the permit and accompanying fact sheet are focused on the permitted discharge arising from electrical power generation and log storage. The Department agrees that SDS Lumber is not exempt from any other federal regulations associated with its operations that include:

40 CFR Sec. 429.123 Subpart K--Sawmills and Planing Mills Subcategory

40 CFR Sec. 429.33 Subpart B--Veneer Subcategory

40 CFR Sec. 429.103 Subpart I--Wet Storage Subcategory

Sections 429.123 and 429.33 BAT limitations are no discharge. SDS Lumber is in full compliance with these regulations. Section 429.103 limits debris from entering navigable waters of the U.S. and pH to a range of 6 to 9. These limitations are applicable for this permit.

Columbia Riverkeeper and the Northwest Environmental Defense Center Comment:

3. According to 40 CFR §125.3(d), when developing technology-based effluent limitations for industrial facilities, the permit writer must consider the cost of achieving effluent reductions. Here, the permit writer did not consider the cost of achieving effluent reductions for heat discharge. This is evidenced by the fact that no cost-benefit analysis was performed on the feasibility of upgrading SDS Lumber's once-through water cooling system to a more state of the art alternative. 40 CFR §125.3(d) is non-discretionary and a cost-benefit analysis on upgrading the SDS Lumber facility's once-through cooling system to a state of the art system must be performed before this permit can be renewed.

Question: What is the economic basis for asserting that it would be unreasonable for SDS Lumber to upgrade their once-through cooling system to a state of the art system?

Departmental Response:

See response to comment #1.

Columbia Riverkeeper and the Northwest Environmental Defense Center Comment:

4. Numerous facilities throughout Washington utilize cooling ponds to reduce their discharges of hot water. The fact sheet provides no explanation as to why this practice is not feasible for SDS Lumber.

Question: What are the specific limitations that prohibit SDS Lumber from annually or seasonally utilizing cooling ponds in order to reduce the large amounts of hot water that the facility discharges into a waterbody that is 303(d) listed for temperature?

Departmental Response:

Please see response to comment #1.

In addition to comment #1 response, consider the fact that the critical season is during the hot summer months. Given the small temperature increase the one pass cooling water undergoes diverting flow to a retention pond in the summer, like the dams along the Columbia, would only heat the water to a higher temperature. Plus, given the small area available to SDS, finding space

for a pond capable of holding 76 acre feet of water a day would be difficult. Once a temperature allocation has been established for the SDS Lumber by the EPA as part of its ongoing TMDL analysis, investigating treatment alternatives might be required.

Columbia Riverkeeper and the Northwest Environmental Defense Center Comment:

5. Allowing SDS Lumber to discharge 25 MGD of pass through, non-contact cooling water into the Columbia River, which is 303(d) listed for temperature within the vicinity of the outfall, would violate the State of Washington's Antidegradation Policy (WAC 173-201A-070).

Question: The Antidegradation Policy requires that discharges into a receiving water cause "no further degradation which would interfere with or become injurious to existing beneficial uses." WAC 173-201A-070. How would this discharge cause no further degradation which would interfere with or become injurious to existing beneficial uses for that section of the Columbia River?

Departmental Response:

The discharge is well within temperature rise criteria at the edge of the chronic mixing zone for this segment of the Columbia River. The discharge flow is 1.1 m^3/sec compared to the critical season flow for the Columbia of 2265 m^3/sec. The permitted maximum temperature at the outfall is no greater than 15 degrees Fahrenheit above ambient temperature.

The Cormix 4.3 model and the Visual Plumes model predict full mixing and a return to ambient temperature within the plume at between 1000 to 3000 feet downstream. Heat is a non-conservative pollutant. It dissipates rapidly especially when the volume is small compared to the receiving water. Anti-degradation is not an issue in this instance. Consider also that SDS Lumber is generating electricity from a renewable resource that, albeit small, does reduce the demand for hydroelectric power.

Columbia Riverkeeper and the Northwest Environmental Defense Center Comment:

6. According to WAC 173-201A-130 (20), temperature in the section of the Columbia River where SDS Lumber is located "shall not exceed 20 degrees Celsius due to human activities. When natural conditions exceed 20 degrees Celsius, no temperature increase will be allowed which will raise the receiving water temperature by 0.3 degrees Celsius." WAC 173-201A-020 defines "natural conditions" as the "surface water quality that was present before any human-caused pollution."

Question: The increase in the Columbia River's water temperature caused by the operation of the Federal Columbia River Power System (FCRPS) is well documented. The operation of the FCRPS is a constant influence on the water temperature of the Columbia River. How can it be determined when water temperatures in the Columbia River are exceeding 20 degrees Celsius

due to natural conditions as opposed to human activities? Does the Department of Ecology have any information on what water temperatures in the Columbia River were before construction of the FCRPS began?

Departmental Response:

From a regulatory standpoint, permit limits are based upon a 7Q10 flow, that is the lowest seven day flow in the past ten years, and ambient concentrations or temperatures. The Department is awaiting guidance associated with the pending Columbia River TMDL in the form of temperature allocations from EPA. If SDS Lumber is included in the final TMDL as requiring a waste load allocation, the NPDES permit will be modified or reissued to include that allocation.